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MATERIALISM

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J.M. WINN M.D., M.R.C.P.

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MATERIALISM.

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BY

J. M. WINN, M.D., M.R.C.P., &c.

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PREFACE.

THIS Treatise on Materialism was originally published in the first number of the new series of the Journal of Psychological Medicine, in April last. The flattering manner in which it was received by many leading members of the medical, as well as the clerical profession, combined with the solicitation of friends, who thought it would be of use in checking the tide of infidelity that is rising so high, in this country and abroad, have induced the author to lay it before the public in a separate form.

31, HARLEY STREET, CAVENDISH SQUARE,

July, 1875.

MATERIALISM.

NOW that the storm of indignation which was excited by Dr. Tyndall's Address, delivered before the British Association at Belfast in August last, has somewhat subsided, the proper time has arrived for taking a calm and dispassionate view of the materialistic doctrines, which the Professor so loudly though eloquently espoused; and for testing their value with regard to biological and mental science. Had it not been for the bright glitter of the Professor's eloquence, it is questionable whether his vehement advocacy of Materialism would have attracted so much attention. His remarks are not original, and he must only be considered,

if we rightly apprehend his meaning, as the supporter of the views of Democritus, Lucretius, Darwin, Huxley, Herbert Spencer, *et hoc genus omne;* nevertheless, as six thousand copies of his printed Address were published in less than two months after its delivery, it shows how attractive the style of the Doctor's writing must be; and it is but just that his arguments, which may be considered those of scientific materialists in general, should receive a careful and candid criticism.

In my remarks I shall chiefly follow the text of the Professor's Address as it was delivered and reported in the *Times;* for the reprint which was subsequently published, in which there are both omissions and additions, greatly qualifies the original meaning.

It is no excuse for the imperfections of the Address that it was written, as he states, in Switzerland, under some disadvantages. The President of the British Association is placed

in a most responsible position, and is looked up to, as a high authority on scientific questions. He should adhere strictly to facts, and not indulge in wild speculations on the origin of life and mind.

Professor Tyndall opens his Address with a sketch of the atomic philosophy, as propounded by Democritus and his successors. Their speculations, though extremely interesting, are so well known as to require little comment, except in so far as they prove that the atomic theory, which he preaches as zealously as if it were a new religion, is more than two thousand years old. His admiration for, and faith in, Lucretius are unbounded. He remarks, with evident satisfaction, Lucretius' notions that the mechanical shock of atoms is the all-sufficient cause of things, and that the constitution of nature has not been "in any way determined by intelligent design"; and he quotes the following atheistical passage

from the poet's writings: "If you will apprehend and keep in mind these things, nature, free at once, and rid of her haughty lords, *is seen to do all things spontaneously of herself, without the meddling of the gods.*" After this, no wonder that Plato and Aristotle are dismissed with scant praise.

In inquiring into the causes which checked the advance of science during the many centuries that passed unmarked by any philosophic discovery, after the days of Pythagoras, Hipparchus, and Ptolemy, the Professor mentions the various causes assigned by other writers, and then proceeds to speak with very bad taste of the introduction of Christianity as one of the stumbling-blocks in the path of progress, though he pays a great and glowing tribute to the heroic fortitude and pure lives of the early Christians. How could he do otherwise? He evidently considers that the benefits conferred by Christianity are to be reckoned as of small

importance if science be at stake. I cannot be surprised at this, when I see by a note in the reprint that one of his great authorities is the infidel Renan.

It is painful to notice throughout the Address the tendency to place religion in antagonism to science, as if we were living in the days of the Inquisition, and it was necessary for Dr. Tyndall to come forward as the champion of free-thought. Never has there been a time of such entire civil and religious liberty as now, when even the atheist Bradlaugh can pour forth his blasphemy in Hyde Park or Trafalgar Square without the slightest hindrance; surely this ought to satisfy the Professor. In the present century some of our best scientific workers have been members of the clerical profession. Few names among geologists are more distinguished than that of the Rev. W. D. Conybeare, the discoverer of the Plesiosaurus, or that of the Rev. Mr. White, of Selborne, as a naturalist; and it happens

somewhat curiously at this present time, as if to refute Dr. Tyndall, that two of the observers appointed to watch the transit of Venus were the Rev. Father Perry, Astronomer of Stonyhurst College, and the Rev. W. Sidgreaves, also of Stonyhurst, both members of the Roman Catholic Church, which has been generally looked upon as the most intolerant of religions. Carried away by this hostile spirit, he seems determined to deprive the poor disbeliever in the almighty atom of every crumb of comfort, for, when speaking of Newton, he says: "When the human mind has achieved greatness, and given evidence of extraordinary power in any domain, there is a tendency to credit it with similar power in all other domains. Thus theologians have found comfort in the thought that Newton dealt with the question of revelation forgetful of the fact that the very devotion of his powers through all the best years of his life to a totally different class of ideas, not to

speak of any natural disqualification, tended to render him less, instead of more, competent to deal with theological and historical questions." I do not agree in this estimate of Newton. He was endowed with such high reasoning powers, to which his imagination was always under subjection, that he could hardly fail to make a sound deduction from any description of facts that were fairly set before him. He was not only well able from his intellectual capacity to comprehend religious truth, but was especially so, from the fact of his having devoted much time and attention to theological subjects, as is proved by his work on the Prophecies, and his letters on the existence of a Deity, written at the request of Dr. Bentley. A man is disqualified for giving a correct opinion on any particular subject by one or other of two causes, either by natural inaptitude, or from his mind being warped by too exclusive attention to some special study. Now we think that both these

causes apply with especial force to the Professor himself. In him the imagination prevails over the reasoning power, and he is more given to flights of fancy than to patient and calm reflection; and, moreover, his mind is evidently biased by the fact that his studies have been chiefly directed to the elucidation of the phenomena of heat, light, radiation, and magnetism. It would have been more prudent if he had adhered to those subjects of which he had been so distinguished an expositor, and refrained from trespassing on the fields of psychology and medicine. When he attempted to write on fever germs, he forgot the old adage, *Ne sutor ultra crepidam.* But there was a moral grandeur about Newton which peculiarly fitted him for the perception and reception of ethical and religious truth. Although he was the greatest natural philosopher that ever lived, there was in him none of that conceit or intellectual pride so conspicuous in the writings of many of the physiologists and

philosophers of the present day. To him the proverbial saying, "Science puffeth up," does not apply; for his modesty was so great that it has been reported of him that he compared himself to a child gathering pebbles on the sea-shore, and occasionally picking up one brighter than those found by his companions.

The arrogance of some of these modern philosophers is glaringly displayed in an anonymous article which appeared in a leading periodical, from which the following extract is taken:— "Among the legitimate solaces of the toils of the modern biologist, there should certainly be reckoned the grim delight, which he were less than human if he did not feel, in terrifying Mrs. Grundy. Merely to hear a Huxley or a Spencer shout 'Boh' to a flock of the terrified orthodox is amusing; but to the man himself who makes it, the fun must be even perilously fascinating." If the writer of this article, so conspicuous for its choice English and gentle-

manly tone, has seen Dr. Tyndall's Address, the Professor's attack on religion must have caused him "grim delight" indeed. In reply to the covert insult, we have only to observe, that although the Archbishop of Canterbury and other timid divines have admitted the possibility that the evolution theory may be true, there is a host of muscular Christians and red-cross knights, both in and out of the Established Church, ready to do battle with Huxley or Spencer or any other champion of the evolution cause. Dr. Watts, of Belfast, has recently given their advocate, Dr. Tyndall, some staggering blows, in his able and eloquent pamphlet on "Atomism." Dr. Ellicott, Bishop of Bristol and Gloucester, a man whose zeal, learning, and calm defence of religious truth has won the respect of all parties, has boldly come forward to meet the attack. In an article on Christian Evidences, in the last January number of the *Sunday at Home*, he makes the following valuable remarks:—"We

have neglected and even discouraged the study of evidences; we have trusted entirely to the inward testimony, and to subjective persuasions, and we now find ourselves face to face with ably urged arguments and startling facts, and a conflict forced upon us which it is worse than disloyal to decline. Before us, able and confident opponents, calmly watching each hurried surrender of some hitherto assumed truth; around us and behind us, either a cold orthodoxy that declines to enter into a controversy with sceptics, or a timid and conventional religion, that has not the faith or the courage to examine its true position, to test the real nature of its defences, and to prepare firmly and charitably to take part in the inevitable encounter."

In referring to the scientific discoveries and remarked intellectual activity of the Arabs during the Middle Ages, and the intrusion of the Moors into Spain, the Professor seizes the opportunity, as is his wont, in the opening part

of his Address, to sneer at Christianity; and remarking on the superstition of the Spanish peasantry, he forgets that in the most civilized countries of the nineteenth century there are still ignorant classes of the community who think it an interference with Providence to make use of vaccination, or to call in the aid of a medical man during illness. He observes: "When smitten with disease, the Christian peasant resorted to a shrine, the Moorish one to an instructed physician." Be this as it may, the Moors, with all their science, were not an unmixed benefit to Spain, and their expulsion in the fifteenth century, and the advantages which accrued therefrom, are thus spoken of by Hume, an author for whom Dr. Tyndall professes great admiration, and who has no Christian proclivities: "Spain, which had hitherto been almost entirely occupied within herself, now became formidable by the union of Arragon and Castile, in the persons of Ferdinand and

Isabella, who, being princes of great capacity, employed their force in enterprises the most advantageous to their combined monarchy. The conquest of Granada from the Moors was then undertaken and brought near to a happy conclusion. And in that expedition the military genius of Spain was revived: honour and security were attained, and her princes, no longer kept in awe by a domestic enemy so dangerous, began to enter into all the transactions of Europe, and make a great figure in every war and negotiation."* It was at this time, too, and under the generous patronage of Isabella, that Columbus discovered a New World. If the power of the Moors had continued triumphant in Spain, would it have done more for civilization and scientific progress than Christianity did, even overrun as it was at that time by error and superstition?

I would not for a moment underrate the

* Hume's "History of England," chap. xxv.

benefit that science has conferred on mankind. By her mastery over the powers of nature she has established the means of communication between the most distant regions of the earth; has brought the productions of other countries to enrich our own, and carried the light of Christianity nearly over the whole world. Nevertheless, it is questionable whether science has ever done as much to ennoble mankind as art and literature, in both of which pursuits Spain shone conspicuously in her palmy days.

After a short sketch of the well-known discoveries of Copernicus and Giordano Bruno, Dr. Tyndall refers with great admiration to the materialistic views of the latter philosopher, who, he says, "Struck with the problem of the generation and maintenance of organisms, and duly pondering it, came to the conclusion that nature in her productions does not imitate the technic of man. Her process is one of unravelling and unfolding. . . . . Matter is not the mere

naked *capacity* which philosophers have pictured her to be, but the universal mother who brings forth all things as the fruit of her own womb." These theories unmistakably exclude the idea of a Creator and superintending Providence, and differ little, if at all, from downright atheism. It is therefore unfair for Darwin and Dr. Tyndall, when they find that they have shocked the public feeling, to say that they do believe in a God (after their own fashion). It is by the help of such an empty protest that many of their admirers, who have not time or opportunity to examine their arguments closely, are led to adopt and believe in doctrines which cannot be proved by the inductive process of reasoning. It is curious and lamentable to see how Dr. Tyndall, with this bigoted belief in molecular power, seizes with avidity on any speculative remark which may have fallen from the pen of some eminent man that may confirm his own opinion, whether in accordance or not with the

general teaching of the writer. In this way he lays hold of some remarks of Descartes on the phenomena of life, as if a consummate *mathematician* must necessarily be an authority on *physiology*. He speaks of him "as the first to reduce, in a manner eminently capable of bearing the test of mental presentation, vital phenomena to purely mechanical principles." In the same admiring spirit he mentions Gassendi, who was both a divine and a natural philosopher, a strong supporter of the molecular hypothesis, and one who Dr. Tyndall says contrived to outstrip Darwin. It seems, after a careful comparison of the doctrines of the atomic philosophers, that they may be divided into two classes—those who believe that the magic atoms were created, and those who must necessarily be driven to believe that they created themselves.

The Professor, in referring to various eminent writers who have held the atomic doctrine, in whole or part, mentions the names of Newton

and Dalton as if they had embraced the same extravagant theory, whereas Newton's grand mathematical law simply implied "that every particle of matter is attracted by, or gravitates to, every other particle of matter, with a force inversely proportionate to the square of the distance"; and Dalton's atomic theory was also of a totally different character, and had reference to the chemical law of multiple proportions. But even this ingenious hypothesis, which has been so valuable to the science of chemistry, has nevertheless, its discrepancies; for, as the late Professor Fownes remarks*: "It is indispensable to draw the broadest possible line of distinction between this, which is at the best but a graceful, ingenious, and, in its place, useful hypothesis, and those great general laws of chemical action which are the pure and unmixed result of *inductive research.*"

* "A Manual of Chemistry." Fifth edition. Revised by H. Bence Jones and A. W. Hofman.

Unfortunately for the Professor, he has placed the arguments of his great teacher, the atheist Lucretius, in juxtaposition with those of the giant Bishop Butler. The reasonings of Lucretius, which he puts in the mouth of a supposed disciple, are the well-known arguments of the materialistic school viz. that a mental picture of "living powers," "percipients or perceiving powers" of "ourselves," cannot be formed "apart from the organisms through which it is supposed to act"; that consciousness is not a necessary element of the true self, because the body may be deprived of consciousness during life by any accident affecting the brain; and, in that case, "Where is the man himself during the period of insensibility?" that brain disease will produce a thorough change of character, converting a moral man into a debauchee, thereby showing that the so-called immortal reason is nothing more than a healthy condition of the brain.

In reply, Dr. Tyndall gives what he imagines

would be the bishop's answers, which I will abbreviate. The bishop is supposed to say: "I do not profess to prove anything absolutely, and I have over and over again insisted on the smallness of our knowledge, or rather on the depth of our ignorance, as regards the whole system of the universe." . . . "I admit that you can build crystalline forms out of the play of molecular force." . . . "I will go further, and acknowledge that even a tree or flower might in this way be organized."† . . . "Your atoms are individually without sensation, much more are they without intelligence. May I ask you, then, to try your hand upon this problem? Take your dead hydrogen atoms, your dead oxygen atoms, your dead carbon atoms, your dead phosphorus atoms, and all the other atoms, dead as grains of shot, of which the

* We cannot believe that the bishop would ever have acknowledged that inorganic matter could of itself make a living plant.

brain is formed. Imagine them separate and sensationless; observe them running together and forming all imaginable combinations. This is a pure mechanical process, is *seeable* by the mind. But, can you see or dream, or in any way imagine how, out of that mechanical act, and from these individually dead atoms, sensation, thought, or emotion are to arise? I can visualize the waves of ether as they cross the eye and hit the retina—and pursue to the central organ the motion thus imparted at the periphery, and see in idea the molecules of the brain thrown into tremors, but the notion baffles me that from these physical tremors things so utterly incongruous with them as sensation, thought, and emotion, can be derived." . . . "You cannot satisfy the human understanding in its demand for logical continuity between molecular processes and the phenomena of consciousness." This fanciful sketch of what Dr. Tyndall believes to be Bishop Butler's opinions on the

question of materialism, is concluded (in the *reprint* of his Address, not as it was delivered) by the following remarkable and inconsistent admission: "*I hold the bishop's views to be unanswerable!*" Far better would it have been for the Professor's reputation if he had calmly reflected on the above arguments before he appeared on the platform of the British Association at Belfast, and if he had then confessed the belief which he has put into the mouth of Bishop Butler, and which has been held by some of our profoundest thinkers—that it is inconceivable that matter should think.

After enumerating all the writers whom he considers favourable to his theory, from the earliest period downwards, he comes to what he looks upon as the crowning-point of all philosophy and knowledge, Mr. Darwin's hypothesis of evolution, which he seems to regard as the greatest discovery ever made by man, forgetting that it is not an immutable law, but

only an unverified theory. It is amusing to find him speaking of it as coming slowly to birth, like the law of gravitation which Newton pondered over for twenty years. In like manner, he says, Darwin reflected on his idea for twenty-two years. He admits that Lamarck had previously shadowed it forth, and that his views on "the development of species out of changes of habit and external condition" were fully set before the public by the author of "Vestiges of Creation." I can remember when that book appeared, and the furor it occasioned, an excitement equal to that caused by Darwin's "Descent of Man." But it was a nine days' wonder, and would have sunk into utter oblivion had it not been revived by the publication of Darwin's work. The sharpest criticism on the "Vestiges of Creation" was one I heard shortly after the time of its appearance. A well-known geologist, speaking of the book to a distinguished astronomer, said, "That's a very clever book, but the author knows very little about geology."

The other replied, "I, too, thought it very clever, but the author is ignorant of astronomy."

Neither Tyndall nor any other enthusiastic supporter of Darwinism can believe that it is capable of being proved by induction. The difficulties to be contended with in its present phase are, in truth, insurmountable. The chief argument in its favour, that on which so much stress is laid, is nothing more than a common fact, well known to all breeders of animals and to every common gardener — that an endless variety of animals and plants can be produced by careful selection, crossing, &c. No one, however, has succeeded in producing a new genus, or a decidedly new species. Can Darwin give a wiser reason for the barrenness of mules than the one commonly received, that the Deity has willed that there should be no confusion of species? If the facts are pressed on the evolutionist, that the forms and features of men and animals are the same now as they were thousands of years ago, as depicted on the Egyptian monuments, or as

still traceable in the mummies of the pyramids, and that the intellect of man has never been developed in a higher degree than it was in the days of the Hebrew prophets and Greek poets, the stereotyped answer is, that evolution requires not only thousands, but billions upon billions of years for the development of a new species. This is dreaming, not sober reasoning, and is best suited for a poem, or a novel like Bulwer Lytton's clever "Coming Race." The palæontologist can read the records of the past stamped on the crust of the earth, but who can read the future of a million years to come? The mind of man has not only a limited field of observation, but has also limits to its own power, and it is not a healthy exercise for the mind to indulge over much in the pleasures of the imagination. So far, however, as we can judge from observation of the past, we see but little prospect of ever bridging over the gulf which separates man from the brute creation.

No one can refrain from admiring the genuine and hearty enthusiasm with which Dr. Tyndall regards Darwin, in whom he sees nothing but perfection, and of whom he speaks as if he were the greatest philosopher that ever lived; but there are many as delighted as he is with Darwin's fascinating descriptions of animal and vegetable life, yet not so blinded by their zeal as to believe in the unlimited application of the law of natural selection. Dr. Tyndall quotes the habits of different species of bees as proofs of the truth of this law, and as showing that the skill of the hive-bee has been developed by evolution step by step through inferior classes of bees. There are high authorities, however, who think that the marvellous ingenuity of the hive-bee was conferred directly, not indirectly, by the hand of the Creator.

It would be an endless task to discuss all the difficulties that beset the theory of evolution. It is impossible for Darwin to answer the ques-

tions that are incessantly cropping up, such as—Through what channel does the nightingale derive her song? Are the wings of birds derived from the quills of the porcupine? Whence did the beaver obtain his constructive power? How did the spider learn to spin her geometric web? or the carrier pigeon acquire her wonderful instinct? Is the beauty of flowers, which are the grace and ornament of the earth, due to natural selection? Questions like these might be asked *ad infinitum*, and in vain. All naturalists have observed the gradation of organisms, from the lowest forms of being up to that of man, on which Darwin and the materialistic physiologists lay so much stress, as well as the similarity of their bodily functions and conformations, showing the archetypal unity which is found throughout all nature; but this fact does not exclude the probability of each species or genus being a separate act of creation, which is the only solution of the difficulty.

One reason for Dr. Tyndall's sympathy with Darwin may possibly be (if the Professor is not mistaken in his opinion) that he does not believe in a Final Cause. These are Dr. Tyndall's words in reference to him: "It is the mind, thus stored with the choicest materials of the teleologist, that rejects teleology," seeking to refer the wonders of the animal and vegetable kingdom to natural causes. He styles this "the method of nature, not the 'technic' of a human artificer." Some evolutionists, who have a sort of belief in a First Cause, are perpetually accusing their opponents of anthropomorphism, exulting in the conviction that their own idea is more consistent with reason than the old-world belief in a Creator of all things. No one can seriously believe that the word Creator is intended to convey the notion of the "technic of man"; but it is our only mode of expressing our conception of the might and mystery of the Author of all things. How can man, with his finite faculties

and limited language, speak of Infinite Power in other than finite words?

After discussing the evolution hypothesis, Professor Tyndall's materialistic views are given still more strongly when he comes to speak of the conservation of energy. He asserts that "vital as well as physical phenomena" are brought "under the dominion of the law of causal connection"; in other words, that vital and physical forces are identical. There is strong ground for believing that Grove's doctrine of the correlation of force applies to heat, electricity, chemical affinity, and motion; but there is no proof that it can be extended to vital phenomena. "Correlation of force" is a clear idea (and, as the late Professor Whewell taught, all discoveries are owing to sound metaphysical conceptions); not so clear the term "conservation of energy," which is not so explicit, but is now so frequently substituted for it. Grove's doctrine has been very loosely

applied by many writers of the day in their endeavours to reconcile phenomena which have nothing in common. Before a correlation of forces can be admitted, it is necessary, according to Mr. Justice Grove's explanation, to prove a mutual convertibility—a see-saw sort of action. Thus heat may mediately or immediately produce electricity, electricity may produce heat. With a total disregard of this clear statement, modern writers speak of the correlation (forgetting to add the word "force") of leaves and roots, of mental and nerve force, of vital and physical force, &c. If we apply the test of Grove's theory to the consideration of vital phenomena, we shall not find that a single instance has been recorded in which vital and physical force have been found interchangeable. No physicist has yet been found able to produce bioplasm * out

* I think Dr. Lionel Beale, in his work on "Disease Germs," has given strong and convincing reasons for substituting the term bioplasm for protoplasm, to signify

of inorganic matter; no physiologist has succeeded in discovering a positive proof of spontaneous generation; nor has any experimental philosopher resuscitated a corpse by means of galvanism. Until these improbable results have been obtained, we must withhold our belief in the molecular doctrines of the present day, however eloquently and ably they may be advocated. I confess that we can no more explain the nature of vital than of any other force; we know of its existence only by seeing its marvellous effects in the growth and reproduction of animal and vegetable organisms, and its power to resist those terribly destructible physical forces which come into play as soon as this mysterious power is withdrawn. This simple, common-sense notion

germinal or *living* matter, as the latter word has recently been used with such a wide significance as to call forth the sarcasm—attributed to Max Müller—"that protoplasm, after creating everything in the universe, finished by creating itself!"

of vitality is more intelligible than any of the molecular theories. If life is only the result of physical force, why is it that a man, *cæteris paribus*, does not live for ever, and why is the span of his existence limited to threescore years and ten? To say the least of it, the term vital force, which so many of the modern school of physiologists condemn, looking at it merely in a scientific point of view, serves conveniently to group together and generalize a large number of facts, which in our present state of knowledge cannot be explained by physical force.

Mr. Herbert Spencer, according to Dr. Tyndall, asserts that vital actions are almost as physical as those that lead to the coalescence of two globules of oil suspended in a mixture of alcohol and water, which do not unite until the pellicles that have formed around them burst. From similar combinations (he gives them the misnomer of organisms), mounting up, step by step, from one to another, he imagines that a

living body is constructed. Had Dr. Tyndall and Mr. Herbert Spencer recognised the wonderful facts revealed by the microscope, which some physicists are apt to despise, they would have perceived that the oil globules, with their pellicles, are totally different from the germinating cells of which a living body is built up. These minute specks, as shown by the microscope, have the powers of absorption, motion, and proliferation, and are, in fact, true living germs. It is apparent that Dr. Tyndall and Mr. Herbert Spencer are unacquainted with the first elements of physiology.

The Professor calls Mr. Herbert Spencer "The Apostle of the Understanding." Does he think that what he says of life, which he defines as "a continuous adjustment of internal relations to external relations," has won for him that title? Can anything be more indefinite than such a definition?

Another theory of life is, that the vital struc-

tures are formed by a sort of crystallisation. A crystal as much resembles a life cell as an icicle does a warm, palpitating, living animal.

As regards the subject of instinct, the evolutionist believes that it is to be accounted for by hereditary transmission; that each animal is "not individually taught; its personal experience is nil, but has the benefit of ancestral experience. In that inherited organization are registered all the powers which it displays at birth." In this manner the chick learns "the very complex co-ordination of eye, muscles, and beak," which enable it, on "coming out of the egg, to balance itself correctly, run about, pick up its food," &c. In all cases of this kind, the evolutionist holds that the instinctive powers displayed by animals are nothing more than the results of organic memory. The law of hereditary transmission cannot be disputed, but the evolutionist carries it to a fabulous length, and in the case of man he asserts that the human brain is a register of

"infinitely numerous experiences *received during the evolution of that series of organisms through which the human organism has been reached.*" If this be true, how is it that man, the last evolved of all creatures, who must therefore have the largest share of ancestral experience, falls so far short of many of the lower animals in co-ordinating power soon after birth? How is it that genius is so seldom inherited and still more rarely transmitted? A writer in the *Quarterly Review* for July 1874, in an article on "Primitive Man," forcibly observes that "the intellect of Aristotle and Newton, the art of Raphael and Shakspeare and Mozart, have their claims to be no bestial developments," and that "their faculties are plainly seen to be different in kind from the complex entanglements of many animal instincts."

On the subject of time and space, Dr. Tyndall adopts Mr. Herbert Spencer's views, and in not very clear language attempts to prove that time

and space are not forms of intuition as Kant taught. His reasoning appears to amount to little more than that contained in his vague definition of life, to which reference has already been made; and is to the effect that "the constant external relations experienced by all organisms will have answering internal relations, and that we have such relations in those of space and time; and being the constant elements of thought, they become the automatic elements of thought." The late Professor Whewell, one of the profoundest thinkers of this century, makes the following remarks in his "Philosophy of the Inductive Sciences," which are opposed to Mr. Spencer's views: "Space and time are forms of perception and intuition, not abstract general conceptions derived from particular cases, but ideas to which we confine the impressions of sense; particular times and spaces are facts of infinite time and space."

In the face of such inconclusive arguments as

Mr. Spencer's, it cannot but excite surprise that Dr. Tyndall should look on him with a sort of reverence, as if he were the impersonation of pure reason. Not satisfied, however, with according him this high honour, he is so strongly influenced by his own enthusiasm, that he cannot help, moreover, endowing him with a small amount of poetical feeling, and believes it possible that even in the serene atmosphere of his elevated position he may occasionally be overcome by the same weakness as ordinary mortals, and that his "ganglia are sometimes the seat of a nascent poetic thrill"!

Towards the close of the Address, the Professor becomes more decidedly materialistic, although in his reprint, and in his preface, he intersperses statements contradicting himself, from which it would seem that on subsequent reflection he was startled at the terribly dangerous lengths to which his visionary doctrines were leading him.

As to Mr. Darwin's "primordial form," he does not appear to have any clearer ideas on the point than Mr. Darwin himself. But Dr. Tyndall carries his views further back than to the starting-point of a "primordial form." He says: "Can we pause here? We break a magnet, and find the poles in each of its fragments. We continue the process of breaking, but, however small the parts, each carries with it, though enfeebled, the polarity of the whole; and when we can break no longer, we prolong the intellectual vision to the polar molecules. Are we not urged to do something similar in the case of life—to cross the boundary of experimental evidence, and discover in that matter which we, in our ignorance, . . . have hitherto covered with opprobium the promise and potency of all terrestrial life?" Is this wild flight of fancy a specimen of "the scientific use of the imagination"? We really know nothing about atoms, and the strangest notions have been entertained

concerning them ever since the days of Democritus; he supposed them to be of various sizes; one philosopher thought they were invisible, and another that they had neither tops nor bottoms. This latter hypothesis is very unfavourable to Dr. Tyndall's theory of molecular polarity.

After the numerous instances adduced of the Professor's belief in the power of molecular force to produce all the phenomena of life, we unexpectedly find that he begins to discover, just as he is about to wind up his discourse, that "there are more things in heaven and earth than are dreamt of in his philosophy," and he confesses that he cannot explain the connection between the nervous system and thought. He says, "We soar into a vacuum when we seek to comprehend the connection between them." Not even Mr. Herbert Spencer can throw any light on this great mystery, and it baffles them both to account for the innate feelings of awe, wonder, and reverence, or for that religious

sentiment, which Dr. Tyndall looks upon as a "form of force" which is dangerous if not limited to its proper sphere of emotion! The strongest contrast, however, to the materialistic opinions so conspicuously brought forward in the Address, as well as in Dr. Tyndall's other published works, is exhibited in the following extract from the preface to the reprint of the Address, which appeared about a month after its delivery. "I have noticed during years of self-observation that it is not in hours of clearness and vigour that this doctrine [material atheism] commends itself to my mind; that in the presence of stronger and healthier thought it ever dissolves and disappears, as offering no solution of the mystery in which we dwell, and of which we form a part." It is deeply to be deplored that Dr. Tyndall did not mention this fact when he delivered his address at Belfast, and promulgated doctrines which are calculated to undermine the faith of thousands, and which,

if true, would shake the very foundations of all morality and religion.

I think I have now carefully examined all the arguments which Dr. Tyndall has brought forward in favour of materialism, and it must be admitted that he signally fails to verify his theory. By his own confession, he but half believes in it himself. The vagueness of his statement and his self-contradiction called forth a leading article in the *Times* of Saturday, the 24th of October, 1874; and on the following Saturday Dr. Lionel Beale published a letter in the same journal, to press upon Dr. Tyndall that "his position as a public teacher, and the authority he wields as President of the British Association, render it imperative, not only that he should at once more accurately define the views he does entertain upon the momentous and far-reaching scientific question he has deliberately, so many times and in so many ways, forced into public notice, but that it is a duty he

owes to science to state more clearly than he has yet done the inferences in favour of his doctrine." I believe that up to the present time Dr. Tyndall has not answered the questions, which Dr. Lionel Beale, from his position as a public teacher of physiology, and as one of the highest living authorities on histology, had a right to ask, and to which he might reasonably expect a reply. The natural inference to be drawn from his silence is, that Dr. Tyndall considers a prudent reticence to be the wisest course.

And now I will take my leave of Dr. Tyndall; but before concluding, it is desirable to make a few remarks on the dogmas and scientific jargon of the new materialistic school of physiology. The doctrines of this school have been gradually gaining ground, and are most conspicuous in the writing of the younger members of the medical profession. Slowly but surely they are spreading through all classes of the community, and especially exerting their baneful influence

over the minds of the rising generation of medical students. Hardly a month passes but some young aspirant for fame contributes to the pages of the medical journals a *réchauffé* of the materialistic theories of life and mind which he has learnt at second hand, and thinks to gain thereby a little ephemeral notoriety.

The modern materialistic school has done incalculable mischief, morally as well as scientifically, not only by spreading widely the flimsiest hypotheses, as if they were established truths, but even the English language itself is getting corrupted by the new philosophical nomenclature that has been adopted in the endeavour to make the new theories intelligible. They will soon require to publish a glossary of the new terms which are accumulating fast. For instance, they call poetic emotion the thrill of a ganglion; thought, cerebration; life, molecular force; creation, evolution; the Deity, a primordial germ; crime, cerebral disease; &c.

The chief dogma of the new school is that mind and all its faculties—perception, memory, will, reason, imagination, as well as all moral attributes—are the result of bodily functions, as if they were secretions from the brain, like those of the liver or kidneys. They have various unintelligible modes of describing the phenomena of the mind. Its operations are spoken of by some as the product of the caudate cells of the brain—by others as a disturbance of the equilibrium of the nervous power—as expressions of material changes in the brain—as an emanation from the body, &c. It seems strange that anyone can believe, or expect others to believe, that assertions like these, unverified by careful scientific inductions, can be substituted for what is commonly understood by the word "mind." Mind is a fact, although it cannot be demonstrated mathematically; its existence is proved by our own consciousness, and its operations are indelibly inscribed on the literature and art

of ages. We know its existence by its effects, and it would be as absurd to doubt it as to doubt that of a God, although we cannot explain the nature of either. That it is connected in a mysterious manner with our organization no one can disbelieve, but we defy any modern physiologist to explain the connection. Even the materialistic Dr. Tyndall, as we remarked before, says "we soar into a vacuum" if we attempt to do so. The new school speaks confidently of their ingenious speculations as if they were facts, and as if recent researches had thrown a flood of light on the functions of the brain and spinal cord; but we should like to ask whether any one really great fact has been elicited since the discoveries of Sir Charles Bell and Marshall Hall. The nervous fibres of sensation and motion have been traced a little further towards the periphery of the brain, but we are as ignorant as ever of the precise functions of the caudate nerve-cells of the cerebral convolutions; we can

only surmise that it is through them that sensations are perceived and volition exercised.

Many of the so-called discoveries of the most painstaking cerebral physiologists are at variance with each other. Some assert positively that memory is intimately connected with the left frontal convolution of the brain; others as positively deny it. It had been for a long time believed that the optic thalami were closely connected with the upper extremities, as motor centres; I find, however, by an article in the *Lancet* (Jan. 23, 1875) that recent experiments on rabbits, by Nothangel, completely dislocate our ideas on the point, for he found that, after destroying the whole of the optic thalami, the rabbits were able to leap about. These facts show that physiologists should pause before asserting that the highest mental manifestations are only emanations from particular portions of the brain, when they have not yet been able to determine the centres of motion and sensation—

questions which lie, as it were, on the threshold of the inquiry. Speculations on the modes in which the marvellous functions of the brain and nervous system are carried on are very valuable in their way, and the hypotheses of men of genius have sometimes led to important discoveries; but speculative reasoning should be confined to essays of a strictly suggestive character, not interspersed in a text-book such as Dr. Carpenter's "Mental Physiology," which, as he states, has been written expressly for the "training and discipline of the mind." It is to be regretted that he has entitled his work "Mental Physiology," as it involves a contradiction; he might as well have called it "Metaphysics of the Body." But, at the same time as we allude to these defects, we bow with deference to his opinion on all matters connected with questions of pure physiology; it is only when he attempts to graft psychology on physiology that we are at issue with him. For instance, in his explanation of

the manner in which vision is produced, he speaks of a correlation of mind force with nerve force, and of nerve force with the chemical change which produces light. If by correlation he means "correlation of force," which, as we have already observed, necessitates mutual convertibility, he must give an instance in which nerve force produces light; but this he has not done. We are, however, gratified to find that Dr. Carpenter does not believe that mind is altogether the result of physical forces, as is shown in the following extract from his recent writings. "In reducing the thinking man to the level of 'a puppet that moves according as his strings are pulled,' the materialistic philosopher places himself in complete antagonism to the positive conviction which, like that of the existence of an external world, is felt by every right-minded man who does not trouble himself by speculating upon the matter, *that he really does possess a self-determining power*, which can

rise above all the promptings of suggestion, and can *within certain limits* mould external circumstances to its own requirements, instead of being completely subjugated by them." This and other admissions have roused the indignation of the biologists, and physiological psychologists, as they illogically call themselves. If they desire to be thought consistent, they should openly declare themselves materialistic physiologists. They differ from Dr. Carpenter in asserting that every faculty of the mind is the result of molecular force, to which they say the nerve-cells are indebted for their existence. Since the publication of Professor Tyndall's Address, the materialistic physiologists have come out stronger than ever, as if his rhetoric had stimulated them to greater exertions. One of these writers looks upon all those who do not agree with the views of the psychological physiologists as wilfully deaf, or the victims of a domineering prejudice He reiterates the opinion of the school—layin

it down as if it were a geometrical axiom—that thought is the product of the grey matter of the brain.

The materialistic physiologists express their belief that the facts presented by the phenomena of insanity afford irrefragable proof of the correctness of their theory, that the mind is only a bodily organ. They point with an air of triumph to the delirium and delusions of those cases of insanity in which brain disease has been discovered after death. They also refer to the benefits which often accrue from purely medical treatment. This beneficial effect they look on as the clearest evidence of the truth of their hypothesis, that mental affections are only diseases of the body. They speak of this as a modern discovery, whereas it was mentioned by Gassendi more than two hundred years ago. That the mind may be perturbed during insanity, as in the delirium of fever, from some bodily derangement, is undoubted; but it is

questionable whether there is positive evidence of brain disease in all cases of acute mania, although degeneration of the brain tissue is sure to be the effect of insanity in chronic cases. It is a well-known fact that in uncomplicated cases of acute mania, where death ensues rapidly from exhaustion, a post-mortem examination detects little more than congestion of the blood-vessels of the brain and its membranes, some subarachnoid effusion, and sometimes opalescence of the arachnoid membrane, but this last appearance is not peculiar to insane cases; the substance of the brain, however, remains intact. Is it not to some kind of morbific force we must look for the cause of a sudden outburst of acute mania, rather than to mere congestion of the brain, which, if to any considerable amount, would be more likely to produce coma than frantic violence? Be this as it may, and even if it be admitted that insanity is one of the instances in which the body acts on the mind, cannot the

psychologist point to innumerable examples of the mind acting on the body? How often in cases of nervous depression from mental anxiety has the bright influence of hope restored health, when all the drugs in the pharmacopœia had failed? And, again, on the other hand, will not a moral shock suddenly convert a healthy man into a raving lunatic? Of what use would medicine alone be in the treatment of the majority of cases of insanity, if it were unaccompanied by moral restraint? A favourite saying with the materialists is, that a man's happiness depends on a healthy state of his digestive organs; yet the converse is equally true, that a mental shock will immediately arrest the functions of the stomach. Shakspeare, who was no materialist, puts this well in Henry VIII.:—

> "Read o'er this;
> And after, this; and then to breakfast, with
> What appetite you have."

It is to be regretted that Dr. Wilks, another zealous supporter of the materialistic physiology, in an article in the *Journal of Mental Science* for January, 1875, gives his countenance to all the extravagances of the physical theory of life and mind. This is the more to be deprecated because his position as a teacher of medicine in one of our largest metropolitan schools gives weight to his opinion on mental disease, whilst it is evident from his own observations that his experience in this branch of medical science is limited indeed. Before noticing his remarks which have especial reference to insanity, a few words must be said on some of the other points which he has treated of in his paper on "The Theory of the Mind from a Physiological Point of View." It is wearisome to hear the disciples of this school perpetually talking of this method of study, as if it were a *novum organum*, a new principle which is to clear up all difficulties relative to the working

of the human mind. The same result was confidently anticipated from craniology, when Gall and Spurzheim first propounded that pseudo-science. How many believers are there in it now?

As a matter of course, like all this school, Dr. Wilks derives his inspirations chiefly from the theories of Darwin and Huxley, but he states that in the doctrine of unconscious cerebration "lies the very pith of his paper." He thinks this doctrine, which is still a vexed question among metaphysicians, will solve many mental and moral problems.

It may be incidentally mentioned that Dr. Wilks has some very singular notions on the subject of insanity; as he could not have derived them from a practical acquaintance with the subject, I can only conclude that he obtained them through the medium of unconscious cerebration, which is supposed to do a great deal of our thinking, without any trouble to ourselves,

like the working of a steam-engine. He suggests "that it is the insane element which imparts what we call genius to the human race"; and as great wits to madness often are allied, I presume it is on that ground that he believes that it might be advantageous for a man to marry into a family predisposed to insanity, on the chance that one of his progeny might turn out a genius; but he might beget an idiot instead; for all medical men who have made careful inquiries into the family history of their insane patients must have found, even if they had not discovered the existence of insanity, that but few of the blood relations had escaped some hereditary taint. Strongly impressed with this fact, I published six years since a treatise "On the Nature and Treatment of Hereditary Disease," in which I offered a theory that has never been confuted, that all hereditary diseases are interchangeable.

The impressions which Dr. Wilks receives

from a visit to an asylum are very peculiar, and different from those which are generally experienced. He says: "In going into an asylum" . . . "I gaze on my fellow-creatures with awe, and not unfrequently with admiration. My feeling has sometimes been rather that of envy than pity, and I should have had no hesitation in parting, had it been possible, with part of one's own slow and prosaic nature for a portion of their confiding ecstasy." Dr. Wilks would have told a different tale had he resided for many years among the insane, and witnessed the misery of the poor lunatics who imagined their souls were lost; heard the blasphemy and obscenity of others; the distressing delusions of those who fancy that their best friends and nearest relations are conspiring to ruin them; and learnt that the "confiding ecstasy" which so charmed him was probably the delirious exaltation of general paralysis. Had he observed this, and much more that it is needless

to detail, his beautiful vision of insanity would soon have faded away. Dr. Wilks concludes his paper by expressing a conviction that what he calls the scientific mode of studying the mind—and this he confines to "the teachings of the *material* world"—will tend to make men more charitable and less self-seeking, and will promote "the leading Christian virtue of loving one another."

It is idle for writers of the above class to talk of anything approaching to religious tendency in their doctrine. If the views of the materialists be true, the inevitable result must be the destruction of all religious belief. If they do not absolutely ignore a Deity, the only conception they have of a Creator is, of a Power whose work was completed countless ages ago, and who has ceased to preside over His handiwork. This removes the Creator so far from us and our sympathies that He becomes a mere vanishing-point in the dim vista of infinity.

Materialism cannot lead to the amelioration of mankind; the ideas of a ruling Providence and a future state being abandoned, brute strength, lying, cunning, and selfishness would be in the ascendant, patriotism would be a thing of the past, and all the horrors of communism would follow. Fortunately, from the constitution of human nature, it never has been nor can be generally believed, for it is not from the ranks of the materialists that we get a Philip Sidney, a Chevalier Bayard, a Lawrence, or a Havelock.

APPENDIX.

SINCE the publication of my paper on "Materialism," more works than one have appeared, by scientific men of note, in which the writers having apparently discovered the dangerous tendency of materialistic doctrines, now attempt, as the *Saturday Review* shrewdly puts it, to temper materialism with faith. The fear that science is opposed to religion is a note of discord that has been sounded from time immemorial, and yet some of the greatest thinkers who ever lived have not found them incompatible. The marvellous discoveries of modern science, when looked at from the right

stand-point, afford additional proof of a wonderful and inscrutable Providence; and, in spite of assertions to the contrary, science has always been ultimately found to be the handmaid of religion, by furnishing accumulating evidence of design. The profound and truthful aphorism of Lord Bacon that—"A little philosophy inclineth man's mind to atheism, but depth in philosophy bringeth men's minds to religion," applies with equal force to the modern systems of philosophy as it did to those of his time. While science can well boast of the marvellous discoveries revealed by the microscope, especially those that have reference to the minute phenomena of life, it must at the same time be admitted that human sight, even when aided to the utmost extent possible by the greatest conceivable microscopic power, will never be able to perceive the minute specks which go to form the organic corpuscle. The same rule applies to telescopic as to microscopic observations,—the power of human vision

is limited as to distance as well as to size. A writer in the *Edinburgh Review* justly remarks, "the material substance in which the special changes are brought about that convert dead matter into living matter cannot be seen by human eyes. They occur in a region of material existence beyond the reach of the visual powers which have been accorded to man."

Two of the most eminent modern natural philosophers, Faraday and Brewster, were firm believers in the truths of Christianity, and they were men conspicuous for their brilliant discoveries of valuable scientific facts, who did not aim at gaining notoriety by the promulgation of crude, though startling hypotheses. Sir Humphrey Davy, a natural philosopher, whose genius is unquestioned, had strong religious convictions. With respect to the immateriality of the soul, he says, "That which teaches will not be felt; that which sees will not be visible

that which commands sensations will not be their subject." Again, "Locke said, Could not God have made matter think. . . . Can a house be its own tenant?"

In referring to the fact that some of our best scientific workers belonged to the clerical profession, the only names given were those of the Rev. Gilbert White and the Rev. Wm. Conybeare, but the list is a long one, and it may not be out of place here to add a few more names:—

Roger Bacon,

Seth Ward (Bishop of Exeter and afterwards of Salisbury, author of "Astronomia Geometrica"),

Wallis (a celebrated mathematician, second only to Sir Isaac Newton),

Bradley (discoverer of aberration and nutation),

Pascal,

Barrow,
Brinkley (the astronomer),
Buckland,
Sedgwick,
Peacock (distinguished for his original views in algebra),
Whewell,
Mosely (known for his valuable contributions to engineering science).

All these were original thinkers. Many more might be added from the ranks of the Jesuits in the Roman Church in the 17th century.

It is some satisfaction to learn that, whilst materialism is so rife in Europe, it is decidedly at a discount on the other side of the Atlantic. The Americans are a quick-witted people, and were among the first to see the errors and satirize the doctrines of the modern school. In the *American Journal of Insanity* for July, 1872, the

following passage occurs in reference to materialism: "This word is now deservedly odious, as representing a doctrine weak in science and unsound in morals."

It might prove to be a useful work if someone, endowed with energy and industry suitable for such a task, were to give an extract of all the philosophic systems, from Democritus down to Herbert Spencer. It might serve as a warning to those ambitious of forming a novel system not to waste their time in following what might prove to be an *ignis fatuus*, calculated to deceive others as well as themselves.

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